

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering & Computer Science
6.041/6.431: Probabilistic Systems Analysis
(Spring 2006)

Tutorial 06 Answer
March 23-24, 2006

1. (a) $a = \frac{2}{3}, b = \frac{1}{3}$.
(b) $\frac{2}{3}e^5 + \frac{1}{3}e^{13(e^5-1)} \approx 6.20 \times 10^{831}$.
(c) $\frac{2}{3} + 13 \cdot \frac{1}{3} \cdot e^{-13} \approx .667$.
(d) $\frac{184}{3}$.
2. (a) $e^{s+5(e^{5s}-1)}$.
(b) $(\frac{3}{4} + \frac{1}{4}e^s) \frac{3}{3-s}$. Note that s must be less than 3 for this to hold.
(c) $\frac{3}{4}e^{5(e^s-1)} + \frac{1}{4} \frac{3}{3-s}$. Note that s must be less than 3 for this to hold.
3. $f_{X+Y}(z) = \begin{cases} \frac{z-3}{2} & 3 \leq z < 4 \\ \frac{1}{2} & 4 \leq z < 5 \\ \frac{6-z}{2} & 5 \leq z \leq 6 \\ 0 & \text{otherwise} \end{cases}$